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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|-------------------------------|------------------|
| 09/857,803 | 06/11/2001 | Hiroji Aga | 109725 | 2312 |
| 25944 | 7590 | 03/12/2003 | | |
| OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320 | | | EXAMINER ESTRADA, MICHELLE | |
| | | | ART UNIT 2823 | PAPER NUMBER |
| | | | DATE MAILED: 03/12/2003 | |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------|------------------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/857,803 | AGA ET AL. <i>(initials)</i> |
| | Examiner | Art Unit |
| | Michelle Estrada | 2823 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
 THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 04 December 2002.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 6-9 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1.) Certified copies of the priority documents have been received.
 2.) Certified copies of the priority documents have been received in Application No. _____.
 3.) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Yamamoto (JP-10275905) and Takada et al. (JP-10335616).

Yamamoto discloses a method for producing an SOI wafer by the hydrogen ion delamination method comprising at least a step of bonding a base wafer (5) and a bond wafer (1) having a micro bubble layer formed by gas ion implantation (See fig. 1c) and a step of delaminating a wafer having an SOI layer (2) at the micro bubble layer as a border, wherein, after the delamination step, the wafer having an SOI layer is subjected to a hydrogen RTA treatment.

Yamamoto does not disclose cooling the wafer, and a heat treatment of a batch furnace.

Takada et al. discloses a semiconductor substrate (11); forming an insulating layer (11a); implanting hydrogen ions into the semiconductor surface; semiconductor substrate (11) is joined to a support substrate (12); the resulting structure is subject to thermal treatment for delamination; and after delamination the laminate (13) is subjected to a thermal treatment (See abstract). The combination teaches annealing by either furnace or RTA. It would have been within the scope of one of ordinary skill in the

art to use either one (furnace or RTA) for the first part of the heating step and the other one for the rest of the heating step. A cooling step would occur after RTA treatment upon removal of the light source.

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Yamamoto and Takada et al. to enable formation of part of the heat treatment of Yamamoto. Also, It would have been within the scope of one of ordinary skill in the art to use hydrogen in the heating step of Takada et al. because it would be used to eliminate the roughness in the surface of the wafer after the delamination step as described by Yamamoto.

Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Yamamoto (JP-10275905) and Takada et al. (JP-10335616) as applied to claims 1 and 2 above, and further in view of Adachi et al. (6,074,479) and Wolf et al. (Vol. 1).

The combination of Yamamoto and Takada et al. does not disclose that the wafer is a CZ wafer of which COPs (Crystal Originated Particles) at least on surface are reduced is used as the bond wafer, and that the CZ wafer is produced from a single crystal ingot.

Adachi et al. discloses a wafer, which is a CZ wafer of which COPs (Crystal Originated Particles) at least on surface are reduced (Col. 1, lines 25-30). It would have been within the scope of one of ordinary skill in the art to employ the CZ wafer of Adachi

et al. to provide the bond wafer of the combination and further enhance quality of the product.

Wolf et al. (Vol. 1) discloses that the CZ wafer can be produced from a single crystal ingot (See pages 23-25).

It would have been within the scope of one of ordinary skill in the art to produce the CZ wafer of Wolf (Vol. 1) to enable the bond wafer of the combination of Yamamoto, Takada et al. and Adachi et al. to be provided.

Response to Arguments

Applicant argues that neither of the cited references, either alone or in combination with each other, teaches or suggests a two-stage (two type) heat treatment process as claimed. However, disclosure of each method being suitable for the entire process is disclosure of each method being suitable for all portions of the process including a first portion and a second portion. In this case, both RTA and batch processing type furnace are disclosed to be suitable for all portions of the annealing step, which suggest employing RTA for the first portion and batch processing type furnace for the second portion. Also, see MPEP 2144.04 (V)(C).

Furthermore, the claims do not require any particular proportion of the annealing step to be accomplished by either RTA or furnace annealing. It would have been within the scope of one of ordinary skill in the art to employ either RTA or furnace annealing

for almost the entire process and to employ the other for a portion of the process that is insufficiently long to be expected to substantially alter the annealing step.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant alleges that unexpected results were obtained. However, the applicant has merely recognized properties of the process made obvious by the combination. Furthermore, applicant does not point to objective evidence establishing unexpected results. Also, the claims are not commensurate in scope with the process described as having unexpected results because the claims do not require any particular proportion of the annealing step to be accomplished by either RTA or furnace annealing.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is (703) 308-0729. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



George Fourson
Primary Examiner
Art Unit 2823



M. Estrada
March 6, 2003